

JOB NO. 94G783-4

DATE 9/6/94

PROJECT Houston-Galveston Navigation
Channel

AREA Houston, Texas

BORING NO. 93-106

SAMPLE NO. 3

DEPTH 4-6 ft

SPECIMEN NO. 1

CLASSIFICATION

Brown, Clay, Medium stiff, w/ sand pockets and shell fragments

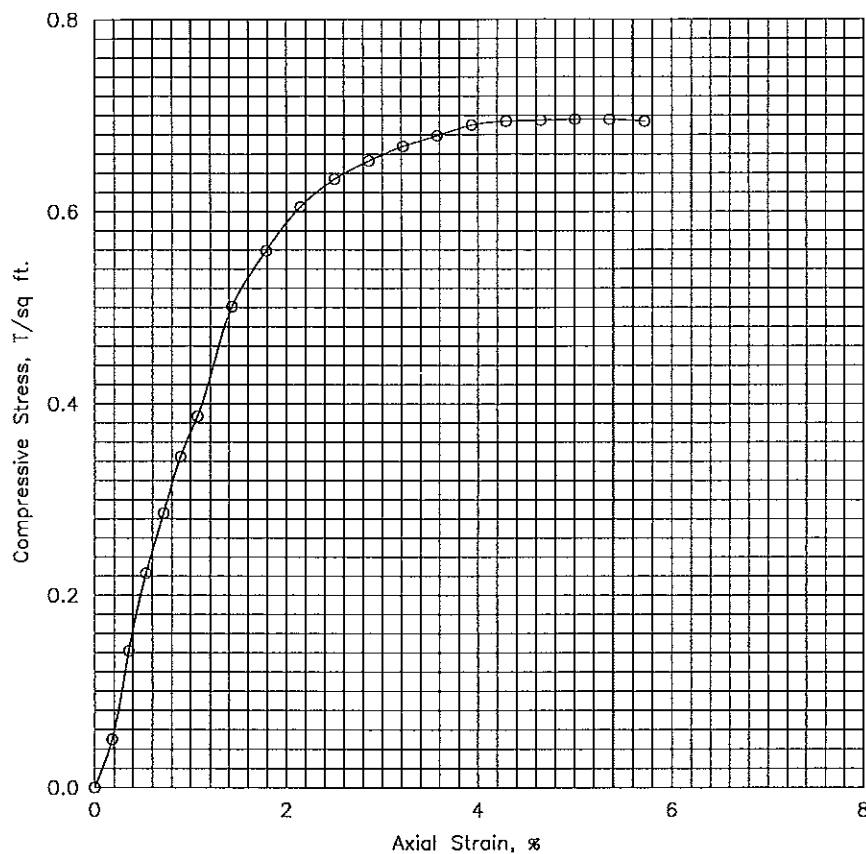
Tare No.	GE-1	Height	5.595 in.
Tare plus Wet Specimen	413.89 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	321.35 gm	Initial Area	6.290 sq in.
Water Weight	92.54 gm	Volume	35.194 cu in.
Tare Weight	42.35 gm	Volume of Solids	cu in.
Wet Specimen	1033.63 gm	Void Ratio	
Dry Specimen	776.18 gm	Saturation	%
Water Content	33.17 %	Dry Density	84.0 lb/cu ft
Specific Gravity of Solids			
LL = 88	PL = 28	PI = 60	

Proving Ring No. 17015

Proving Ring Constant, K = .311 lbs/div.

Elapsed Time min.	Dial Reading 0.001"	Cumulative Change in.	Proving Ring Dial Reading	Axial Load lb	Axial Strain	Area Corr. sq in.	Compr. Stress tsf
-----	-----	-----	-----	-----	-----	-----	-----
.0	0.	.000	.0	.0	.000	6.29	.000
.3	10.	.010	14.0	4.3	.002	6.30	.050
.7	20.	.020	40.0	12.4	.004	6.31	.142
.9	30.	.030	63.0	19.6	.005	6.32	.223
1.0	40.	.040	81.0	25.2	.007	6.34	.286
1.2	50.	.050	98.0	30.4	.009	6.35	.345
1.5	60.	.060	110.0	34.2	.011	6.36	.387
1.7	80.	.080	143.0	44.4	.014	6.38	.501
2.0	100.	.100	160.0	49.7	.018	6.40	.559
2.4	120.	.120	174.0	54.0	.021	6.43	.605
2.7	140.	.140	183.0	56.8	.025	6.45	.634
3.1	160.	.160	189.0	58.7	.029	6.48	.653
3.4	180.	.180	194.0	60.3	.032	6.50	.668
3.7	200.	.200	198.0	61.5	.036	6.52	.679
4.0	220.	.220	202.0	62.7	.039	6.55	.690
4.4	240.	.240	204.0	63.4	.043	6.57	.694
4.7	260.	.260	205.0	63.7	.046	6.60	.695
4.9	280.	.280	206.0	64.0	.050	6.62	.696
5.3	300.	.300	207.0	64.3	.054	6.65	.696
5.7	320.	.320	207.0	64.3	.057	6.67	.694

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.		1			
Type of Specimen		Undisturbed			
Initial	Water content	w_0	33.2 %	%	%
	Void ratio	e_0			
	Saturation	S_0	%	%	%
	Dry density, lb/cu ft	γ_d	84.0		
Time to failure, min		t_f	5.32		
Unconfined compressive strength, T/sq ft		q_u	.70		
Undrained shear strength, T/sq ft		S_u	.35		
Sensitivity ratio		S_t			
Initial specimen diameter, in.		D_0	2.830		
Initial specimen height, in.		H_0	5.595		
Classification Brown, Clay, Medium stiff, w/ sand pockets and shell fragments					
LL	88	PL	28	PI	60
Remarks		Project Houston-Galveston Navigation Channel Area Houston, Texas Boring No. 93-106 Sample No. 3 Depth 4-6 ft Date 9/6/94			
UNCONFINED COMPRESSION TEST REPORT					

JOB NO. 94G783-4

DATE 9/6/94

PROJECT Houston-Galveston Navigation
Channel

AREA Houston, Texas

BORING NO. 93-106

SAMPLE NO. 7

DEPTH 12-14 ft

SPECIMEN NO. 1

CLASSIFICATION

Brown, Clay, Medium stiff

Tare No.	KL-1	Height	5.595 in.
Tare plus Wet Specimen	332.30 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	223.41 gm	Initial Area	6.290 sq in.
Water Weight	108.89 gm	Volume	35.194 cu in.
Tare Weight	42.26 gm	Volume of Solids	cu in.
Wet Specimen	922.40 gm	Void Ratio	
Dry Specimen	576.10 gm	Saturation	%
Water Content	60.11 %	Dry Density	62.4 lb/cu ft
Specific Gravity of Solids			
LL = 71	PL = 28	PI = 43	

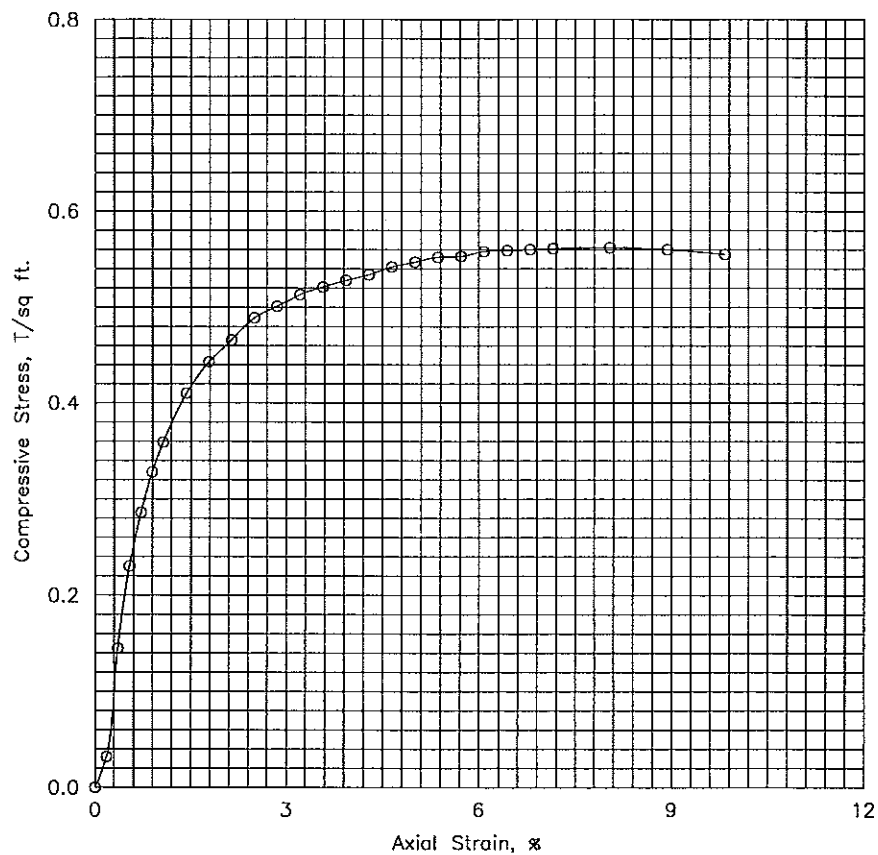
Proving Ring No. 17015

Proving Ring Constant, K = .311 lbs/div.

Elapsed Time min.	Dial Reading 0.001"	Cumulative Change in.	Proving Ring Dial Reading	Axial Load lb	Axial Strain	Area Corr. sq in.	Compr. Stress tsf
.0	0.	.000	.0	.0	.000	6.29	.000
.3	10.	.010	9.0	2.8	.002	6.30	.032
.6	20.	.020	41.0	12.7	.004	6.31	.145
.8	30.	.030	65.0	20.2	.005	6.32	.230
1.0	40.	.040	81.0	25.2	.007	6.34	.286
1.2	50.	.050	93.0	28.9	.009	6.35	.328
1.4	60.	.060	102.0	31.7	.011	6.36	.359
1.7	80.	.080	117.0	36.3	.014	6.38	.410
2.0	100.	.100	127.0	39.4	.018	6.40	.443
2.3	120.	.120	134.0	41.6	.021	6.43	.466
2.7	140.	.140	141.0	43.8	.025	6.45	.489
3.0	160.	.160	145.0	45.0	.029	6.48	.501
3.3	180.	.180	149.0	46.3	.032	6.50	.513
3.6	200.	.200	152.0	47.2	.036	6.52	.521
4.0	220.	.220	154.5	48.0	.039	6.55	.528
4.3	240.	.240	157.0	48.8	.043	6.57	.534
4.6	260.	.260	160.0	49.7	.046	6.60	.542
5.0	280.	.280	162.0	50.3	.050	6.62	.547
5.3	300.	.300	164.0	50.9	.054	6.65	.552
5.6	320.	.320	165.0	51.2	.057	6.67	.553
5.9	340.	.340	167.0	51.9	.061	6.70	.558
6.2	360.	.360	168.0	52.2	.064	6.72	.559
6.6	380.	.380	169.0	52.5	.068	6.75	.560
6.9	400.	.400	170.0	52.8	.071	6.77	.561
7.8	450.	.450	172.0	53.4	.080	6.84	.562
8.6	500.	.500	173.0	53.7	.089	6.91	.560

9.2	550.	.550	173.0	53.7	.098	6.98	.555
-----	------	------	-------	------	------	------	------

Failure Sketches



□ Controlled stress
 ⊗ Controlled strain

Test No.		1			
Type of Specimen		Undisturbed			
Initial	Water content	w_0	60.1 %	%	%
	Void ratio	e_0			
	Saturation	S_0	%	%	%
	Dry density, lb/cu ft	γ_d	62.4		
Time to failure, min		t_f	7.80		
Unconfined compressive strength, T/sq ft		q_u	.56		
Undrained shear strength, T/sq ft		S_u	.28		
Sensitivity ratio		S_t			
Initial specimen diameter, in.		D_0	2.830		
Initial specimen height, in.		H_0	5.595		
Classification Brown, Clay, Medium stiff					
LL	71	PL	28	PI	43
Remarks		Project Houston-Galveston Navigation Channel Area Houston, Texas Boring No. 93-106 Sample No. 7 Depth 12-14 ft Date 9/6/94 EI			
UNCONFINED COMPRESSION TEST REPORT					

U.S. ARMY CORPS OF ENGINEERS

DEPTH, FEET		SAMPLE NO.		PEN./TORVANE		SPT.-BLOW COUNT		BORING NO. <u>93-106</u> DATE: BEGIN <u>8/3/94</u> PAGE <u>1/2</u> JOB NO. <u>946783-1</u> COMPLETE <u>Thin Walled Tube</u> PROJECT <u>HOUSTON-GALVESTON Navigation Channel</u> ☒ 3" ☐ 6" LOCATION <u>LEVEE DISPOSAL AREA 16</u> ELEVATION OF HOLE _____ MANUFACTURER'S DESIGNATION OF DRILL RIG <u>Arco K4X4, C-1000 Marsh Buggy</u> GROUNDWATER: DEPTH <u>2</u> ft., ELEV. _____ ft., at end of Drilling WEATHER <u>Sunny/HOT</u> DRILLER <u>DAVID GREGURICK</u> LOGGER <u>Willie Barnes/Rusty Teehan</u>				
				COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS				
Torvane Reading		0										
		1	4.5	Brown	Clay	Hard	SANDY	w/ROOTS 0-2'				
		2	4.5	Brown	Clay	Hard	SANDY	w/SHELL FRAGMENTS 2-4'				
		3	2.5	Brown	Clay	Medium stiff	SANDY	w/SHELL FRAGMENTS 4-6'				
		4	0.75	Brown	Clay	Medium stiff	SANDY	w/SHELL FRAGMENTS 6-8'				
		5	0.5	Brown	Clay	Medium stiff	SANDY					
		6	0.5	Brown	Clay	Medium stiff	SANDY	w/SHELL FRAGMENTS 10-12'				
0.28		7	0.00 0.05	Brown	Clay	Very soft	SANDY	Sand AT BOTTOM of sample				
		8	1 1/5	Gray	SAND	LOOSE	silty					
								Clay AT 19'				
0.25		9	0.00 0.05	Gray	CLAY	VERY SOFT	SANDY	w/Sand Layer 20.5-21'				
		10	2 1/8	Gray	SAND	MEDIUM DENSE	SILTY					
		11	4 1/6	Gray	SAND	MEDIUM DENSE	SILTY	w/SHELL FRAGMENTS				
		12	2 1/3	Gray	SAND	LOOSE	SILTY	w/SHELL FRAGMENTS				

U.S. ARMY CORPS OF ENGINEERS

DEPTH, FEET	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	BORING NO. <u>93-106</u> DATE: BEGIN <u>8/3/94</u> PAGE <u>2 / 2</u> JOB NO. <u>946783.1</u> COMPLETE <u>8/3/94</u> Thin Walled Tube PROJECT <u>Houston-Galveston Navigation Channel</u> ☒ 3" ☐ 6" LOCATION <u>LEVEE @ DISPOSAL AREA 16</u> ELEVATION OF HOLE _____ MANUFACTURER'S DESIGNATION OF DRILL RIG <u>Ardea K44, C-1000 Marsh Buggy</u> GROUNDWATER: DEPTH <u>0</u> ft., ELEV. _____ ft., at end of Drilling WEATHER <u>SUNNY / HOT</u> DRILLER <u>DAVID GREGUR</u> LOGGER <u>Willie Barnes / Rusty Teehan</u>				
			COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
-35-							
	X 13	2 2/3 / 4	GRAY	SAND	LOOSE	SILTY	w/ SHELL FRAGMENTS
	X 14	3 1/4 / 5	GRAY	SAND	LOOSE	SILTY	w/ SHELL FRAGMENTS
-40-							
-45-							
-50-							
-55-							
-60-							
-65-							
-70-							

Torvane Multiplier 0.2

Project: Houston-Galveston Navigation Channel

SUMMARY OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-106

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	P L (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0 - 2	4.50		Brown,Clay,Hard,Sandy	C L	24.1											
2	2 - 4	4.25		Brown,Clay,Hard,Sandy	C L	22.7											
3	4 - 6	0.50		Brown,Clay,Medium stiff,w/sand pockets and shell fragments	C H	33.2	84.0	111.9	88.0	28.0	99.6*	99.2*	98.4*	96.9	92.2		0.70
4	6 - 8	0.50		Brown,Clay,Medium stiff,w/sand pockets and shell fragments	C H	44.2											
5	8 - 10	0.50		Brown,Clay,Medium stiff,w/sand pockets and shell fragments	C H	43.0											
6	10 - 12	0.75		Brown,Clay,Medium stiff,w/sand pockets and shell fragments	C H	46.7											
7	12 - 14	0.50		Brown,Clay,Medium stiff	C H	60.1	62.4	99.9	71.0	28.0	100.0	100.0	100.0	100.0	100.0		0.56
8	14-15.5		9	Gray,Sand,Loose,Silty	S M						100.0	100.0	99.8	68.6	43.2		
9	19-21	0.00		Gray,Clay,Very soft,w/sand pockets	C H	76.5											
10	21-22.5		12	Gray,Sand,Medium dense,Silty,w/shell fragments	S M												
11	26-27.5		11	Gray,Sand,Medium dense,Silty,w/shell fragments	S M						99.3*	98.9*	98.0*	63.0	41.8		
12	31-32.5		6	Gray,Sand,Loose,Silty,w/shell fragments	S M												
13	36-37.5		7	Gray,Sand,Loose,Silty,w/shell fragments	S M												
14	38.5-40		9	Gray,Sand,Loose,Silty,w/shell fragments	S M												

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classification, M c : Moisture Content

q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe

* : Material retained are shell fragments